

WHAT IS CLAIMED IS:

1. An exhaust emission control apparatus of an internal combustion engine in which combustion is continuously performed at a lean air/fuel ratio, the exhaust emission control apparatus comprising:
- 5 a NO_x catalyst provided in an exhaust passage of the internal combustion engine for storing NO_x contained in an exhaust gas at a lean air/fuel ratio flowing into the exhaust passage, and reducing the stored NO_x in the presence of a reducing agent in the exhaust gas when the air/fuel ratio of the exhaust gas is lowered,
- 10 a reducing agent supply valve that is provided in the exhaust passage upstream of the NO_x catalyst, through which the reducing agent is supplied to the NO_x catalyst, and
- a controller that temporarily decreases the flow rate of the exhaust gas while supplying the reducing agent through the reducing agent supply valve so as to
- 15 execute a control of the flow rate of the exhaust gas flowing through the NO_x catalyst in accordance with a value indicating a state of the exhaust gas flowing through the NO_x catalyst, the value being variable upon supply of the reducing agent through the reducing agent supply valve.
2. The exhaust emission control apparatus according to claim 1, wherein
- 20 the value indicating the state of the exhaust gas comprises at least one of an oxygen concentration of the exhaust gas, a temperature of the exhaust gas, a NO_x concentration of the exhaust gas, and a reducing agent concentration of the exhaust gas.
3. The exhaust emission control apparatus according to claim 1, wherein
- 25 the controller controls the flow rate of the exhaust gas that flows through the NO_x catalyst upon the supply of the reducing agent through the reducing agent supply valve such that the value indicating the state of the exhaust gas accords with a target value.
4. The exhaust emission control apparatus according to claim 1, wherein
- 30 the controller controls the flow rate of the exhaust gas that flows through the NO_x catalyst upon the supply of the reducing agent through the reducing agent supply valve such that the value indicating the state of the exhaust gas becomes one of a maximum value and a minimum value.

5. The exhaust emission control apparatus according to claim 1, wherein the controller controls the flow rate of the exhaust gas that flows through the NO_x catalyst upon the supply of the reducing agent through the reducing agent supply valve so as to accord a time period elapsing from a predetermined reference timing until the value indicating the state of the exhaust gas reaches a peak upon the supply of the reducing agent through the reducing agent supply valve with a target time period.

6. The exhaust emission control apparatus according to claim 1, wherein the controller controls a quantity of the reducing agent supplied through the reducing agent supply valve on the basis of the value indicating the state of the exhaust gas at one of a timing before and after the execution of the control of the flow rate of the exhaust gas that flows through the NO_x catalyst upon the supply of the reducing agent through the reducing agent supply valve.

7. The exhaust emission control apparatus according to claim 1, wherein the controller serves to continuously change the flow rate of the exhaust gas from a timing when the flow rate of the exhaust gas flowing through the NO_x catalyst is decreased until restoration of the flow rate of the exhaust gas.

8. The exhaust emission control apparatus according to claim 1, wherein the controller serves to decrease the flow rate of the exhaust gas that flows into the NO_x catalyst so as to be temporarily held until the flow rate is restored.

9. The exhaust emission control apparatus according to claim 1, wherein the controller controls a time period taken for the supply of the reducing agent through the reducing agent supply valve on the basis of the value indicating the state of the exhaust gas.

10. An exhaust emission control method of an internal combustion engine in which combustion is continuously performed at a lean air/fuel ratio, and a NO_x catalyst is provided in an exhaust passage of the internal combustion engine for storing NO_x contained in an exhaust gas at a lean air/fuel ratio flowing into the exhaust passage, and reducing the stored NO_x in the presence of a reducing agent in the exhaust gas when the air/fuel ratio of the exhaust gas is lowered, and a reducing agent supply valve is provided in the exhaust passage upstream of the NO_x catalyst, through which the reducing agent is supplied to the NO_x catalyst, the exhaust emission control method comprising temporarily decreasing the flow rate of the exhaust gas while supplying the reducing agent through the reducing agent supply

valve so as to execute a control of the flow rate of the exhaust gas flowing through the NO_x catalyst in accordance with a value indicating a state of the exhaust gas flowing through the NO_x catalyst, the value being variable upon supply of the reducing agent through the reducing agent supply valve.

5 11. The exhaust emission control method according to claim 10, wherein at least one of an oxygen concentration of the exhaust gas, a temperature of the exhaust gas, a NO_x concentration of the exhaust gas, and a reducing agent concentration of the exhaust gas is detected as the value indicating the state of the exhaust gas.

10 12. The exhaust emission control method according to claim 10, wherein the flow rate of the exhaust gas that flows through the NO_x catalyst upon the supply of the reducing agent through the reducing agent supply valve is controlled such that the value indicating the state of the exhaust gas accords with a target value.

15 13. The exhaust emission control method according to claim 10, wherein the flow rate of the exhaust gas that flows through the NO_x catalyst upon the supply of the reducing agent through the reducing agent supply valve is controlled such that the value indicating the state of the exhaust gas becomes one of a maximum value and a minimum value.

20 14. The exhaust emission control apparatus according to claim 10, wherein the flow rate of the exhaust gas that flows through the NO_x catalyst upon the supply of the reducing agent through the reducing agent supply valve is controlled so as to accord a time period elapsing from a predetermined reference timing until the value indicating the state of the exhaust gas reaches a peak upon the supply of the reducing agent through the reducing agent supply valve with a target time period.

25 15. The exhaust emission control apparatus according to claim 10, wherein a quantity of the reducing agent supplied through the reducing agent supply valve is controlled on the basis of the value indicating the state of the exhaust gas at one of a timing before and after the execution of the control of the flow rate of the exhaust gas that flows through the NO_x catalyst upon the supply of the reducing agent through the
30 reducing agent supply valve.

16. The exhaust emission control apparatus according to claim 10, wherein the flow rate of the exhaust gas is continuously changed from a timing when the flow rate of the exhaust gas flowing through the NO_x catalyst is decreased until restoration of the flow rate of the exhaust gas.

17. The exhaust emission control apparatus according to claim 10, wherein the flow rate of the exhaust gas that flows into the NO_x catalyst is decreased so as to be temporarily held until the flow rate is restored.

5 18. The exhaust emission control apparatus according to claim 10, wherein a time period taken for the supply of the reducing agent through the reducing agent supply valve is controlled on the basis of the value indicating the state of the exhaust gas.